IN THE CLAIMS:

Claims pending

- At time of the Action: Claims 1-13.
- After this Response: Claims 1-9 and 11-18.

Currently Amended claims: Claims 1, 3, 7, and 13.

Currently Canceled claims: Claim 10.

New claims: Claims 14-18.

1. (Currently Amended) A method, comprising:

filtering a scanned image to obtain a transformed image, wherein the transformed image comprises a series of substantially parallel lines of alternating binary pixel values; and

determining an orientation angle of the scanned image using properties of the transformed image, wherein determining an orientation angle of the scanned image using properties of the transformed image comprises determining an orientation angle using the arctangent of an estimated number of changes in binary pixel values along one or more columns of the transformed image divided by an estimated number of changes in binary pixel values along one or more rows of the transformed image.

2. (Original) The method of claim 1, wherein filtering a scanned image to obtain a transformed image comprises applying a linear shift invariant filter to

the scanned image to remove meaningful picture information from the scanned image.

3. (Currently Amended) The method of claim 1, wherein determining an orientation angle of the scanned image using properties of the transformed image comprises:

estimating [[a]]the number of changes in binary pixel values along the one or more rows of the transformed image;

estimating [[a]]the number of changes in binary pixel values along the one or more columns of the transformed image.; and

~~determining an orientation angle using the arctangent of the number of changes in binary values along one or more columns divided by the number of changes in binary values along one or more rows.~~

4. (Original) The method of claim 1, further comprising subtracting a printing angle from the orientation angle to estimate a rotation angle.

5. (Original) The method of claim 1, wherein determining an orientation angle of the scanned image using properties of the transformed image comprises:

generating a matrix, z, wherein z comprises rows of uniform binary values, and wherein the binary values of one row differ from the binary values of the remaining rows;

for a series of angles θi, wherein $\theta min \leq \theta i \leq \theta max$, repeating the operations:

generating a transformed matrix $z\theta$ by rotating the matrix z through θi degrees;

generating at least one set of coordinates $(x\theta, y\theta)$;

computing a correlation function between the binary values of the transformed image and the image $z\theta$ positioned at $(x\theta, y\theta)$ of the transformed image; and

selecting the angle θi that maximizes the correlation function.

6. (Original) The method of claim 1, further comprising estimating a translation amount of the scanned image, wherein estimating a translation amount comprises:

subtracting a printing angle from the orientation angle to estimate a rotation angle;

rotating the scanned image through the rotation angle; and

determining an (x, y) coordinate set that maximizes a correlation between a portion of the scanned image and an original digital image.

7. (Currently Amended) A computer-readable medium comprising computer-executable instructions that, when executed, direct a computer to:

remove meaningful image information from a scanned image to generate a transformed image;[[and]]

determine an orientation angle of the scanned image using the transformed image;

subtract a printing angle from the orientation angle to estimate a rotation angle; and

rotate the scanned image through the rotation angle.

8. (Original) The computer readable medium of claim 7, further comprising computer-executable instructions that, when executed, direct a computer to apply a linear shift invariant filter to the scanned image to remove meaning image information from the scanned image.

9. (Original) The computer readable medium of claim 7, wherein the instructions for determining an orientation angle of the scanned image using properties of the transformed image comprise computer-executable instructions that, when executed, direct a computer to determine an orientation angle using the estimated periodicity of changes in binary pixel values along one or more rows of

the transformed image and the estimated periodicity of changes in binary pixel values along one or more columns of the transformed image.

10. (Canceled)

11. (Original) The computer readable medium of claim 7, wherein instructions for determining an orientation angle of the scanned image using the transformed image comprise computer-executable instructions that, when executed, direct a computer to determine an angle that maximizes a correlation function between the intersection of the transformed image and a matrix of binary values comprising at least one array of uniform binary values.

12. (Original) The computer readable medium of claim 7, wherein instructions for determining an orientation angle of the scanned image using properties of the transformed image comprise computer-executable instructions that, when executed, direct a computer to:

generate a binary matrix, z, wherein z comprises rows of uniform binary values, and wherein the binary values of one row differ from the binary values of the remaining rows;

for a series of angles θi, wherein $\theta min \leq \theta i \leq \theta max$:

generate an image $z\theta$ by rotating z through θi degrees;

generate at least one set of coordinates (xθ, yθ);

compute a correlation function between the binary values of the transformed image and the image zθ positioned at (xθ, yθ) of the transformed image; and

select the angle θi that maximizes the correlation function.

13. (Currently Amended) The computer readable medium of claim 7, further comprising instructions for estimating a translation amount of the scanned image that, when executed, direct a computer to:

~~subtract a printing angle from the orientation angle to estimate a rotation angle;~~

~~rotate the scanned image through the rotation angle; and~~

determine an (x, y) coordinate set that maximizes a correlation between a portion of the scanned image and an original digital image.

14. (New) A method, comprising:

filtering a scanned image to obtain a transformed image, wherein the transformed image comprises a series of substantially parallel lines of alternating binary pixel values;

determining an orientation angle of the scanned image using properties of the transformed image;

subtracting a printing angle from the orientation angle to estimate a rotation angle; and

rotating the scanned image through the rotation angle.

15. (New) The method of claim 14, wherein filtering a scanned image to obtain a transformed image comprises applying a linear shift invariant filter to the scanned image to remove meaningful picture information from the scanned image.

16. (New) The method of claim 14, wherein determining an orientation angle of the scanned image using properties of the transformed image comprises:

estimating a number of changes in binary pixel values along one or more rows of the transformed image;

estimating a number of changes in binary pixel values along one or more columns of the transformed image; and

determining an orientation angle using the arctangent of the number of changes in binary values along one or more columns divided by the number of changes in binary values along one or more rows.

17. (New) The method of claim 14, wherein determining an orientation angle of the scanned image using properties of the transformed image comprises:

generating a matrix, z, wherein z comprises rows of uniform binary values, and wherein the binary values of one row differ from the binary values of the remaining rows;

for a series of angles θi, wherein $\theta min \leq \theta i \leq \theta max$, repeating the operations:

generating a transformed matrix $z\theta$ by rotating the matrix z through θi degrees;

generating at least one set of coordinates $(x\theta, y\theta)$;

computing a correlation function between the binary values of the transformed image and the image $z\theta$ positioned at $(x\theta, y\theta)$ of the transformed image; and

selecting the angle θi that maximizes the correlation function.

18. (New) The method of claim 14, further comprising estimating a translation amount of the scanned image, wherein estimating a translation amount comprises:

determining an (x, y) coordinate set that maximizes a correlation between a portion of the scanned image and an original digital image.